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DOUBLE-BROODEDNESS IN THE SILVER GULL *LARUS NOVAE-HOLLANDIAE*

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Though the fact has been mentioned in the literature that the Australian Silver Gull (*Larus novae-hollandiae*) is unique among the gull species of the world in being double-brooded (cf. Moynihan, 1955) the phenomenon has been very rarely described. In fact the only published instance that has come to my attention is a South Australian observation of over 50 years ago (King, 1913). Nothing similar appears to have come under the notice of the team of workers in the elaborate study of the Silver Gull by the Altona Study Group in Victoria, and in fact the phenomenon is not referred to at all in the detailed report of this investigation (Wheeler and Watson, 1963), which purports to be a comprehensive review of Silver Gull biology in Australia.

Tinbergen and Broekhuysen (1954: 50) hinted that in the South African subspecies of this gull (*L. n. hartlaubi*) "it seemed probable that the gulls of this (Robben I.) colony had two successive broods in one spring season." They deduced this from the population studies at the time of their visit but gave no other details.

The present article describes a case of double-broodedness which occurred among Silver Gulls in a wild bird hospital I maintain at my home in Ciree Circle, Dalkeith.

Since 1960 I have treated a total of 67 Silver Gulls. At the present time 22 individuals, incapacitated by wing disabilities, roam freely in the large back garden which comprises the hospital. Although the majority are juveniles, a breeding nucleus has formed and in 1963 a study was begun on the breeding behaviour of these birds.

Since keeping Silver Gulls I have noticed that twice in the one year the adult birds show a waxing and waning in the coloration of the bill, legs, feet, mouth and eyelids. Each individual saturates its own particular red tone to the fullest intensity, the intensity peaks being late autumn and mid-spring, with lulls of dulling in summer and late winter. The late winter dulling, however, is neither as noticeable nor as prolonged as the summer dulling.

In 1963 the first flush of the bill and legs showed in mid-February, during which month three adult males left the flock to take up solitary stations at various parts of the yard. They each repulsed

any approach by other gulls, even females, and threatened and fought one another well into March. By the end of March each had "staked out" a large territory, and three females from the flock made persistent and increasingly successful invasions of the respective territories.

I might mention at this point that with practice it is possible to sex gulls by their stature and conformation. The male is invariably the larger bird of a pair, and has a higher longer crown, giving his head a more angular appearance. The female's head is rounded, a feature which gives her face a milder look.

During April the three forming pairs courted, maintained territory boundaries, and in late April were making nest scrapes in various places. Fights between the territory owners were sometimes savage, and the repulsion of highly coloured unattached gulls from the vicinity was vigorous. It was noticed, however, that uncoloured juveniles were treated less violently, which in one case is worthy of note. One large dark-legged juvenile male invaded the territory of the top-ranking male breeder, usurped a small portion of it, and built a nest within two feet of a scrape belonging to the breeder. This pre-breeder made several clumsy attempts to court the breeder's female, but was only mildly repulsed by her mate. The breeder male would even leave his mate alone near the pre-breeder while he dashed off to some remote corner of the territory to warn off some "coloured" gull happening by. Later in the season the pre-breeder was completely ignored, while coloured birds were still attacked. This year, 1964, that same youngster has attained adulthood, is highly coloured, and the most formidable rival of the top male.

By early June the territory boundaries were relatively stable, though fiercely patrolled. Each pair had constructed two or three nests, and copulations were observed. In late June one nest in each respective territory had been selected "favourite," and the pairs began to sit on and change over at these nests as though actually incubating. Courtship feeding and copulations reached a peak at this stage.

The top-ranking pair produced their first egg on July 15, 1963, and incubation began immediately. A second egg was laid on July 17, 43½ hours after the first.

On August 7, 1963, the 24th day of incubation, the first-laid egg showed its first big crack in the shell pattern. However, the cracking hardly progressed until the second egg reached its own respective 24th day of incubation, and showed its first crack, two days later, whereafter the two progressed in fairly parallel manner, both hatching on August 10, despite an interval of almost two days at laying. The other two breeding pairs continued to take turns sitting on their empty nests, each bird sitting between ½-3 hours at a time. Despite copulations no eggs were produced, and in August the copulations ceased and the pairs drifted away from their nests, although remaining near the territories.

During August and early September the successful pair tended

their offspring. However, by mid-September the female took to food-begging from the male again, and repulsed the advances of her large chicks. At the end of September all three pairs had returned to their territories and fighting broke out anew, with courtship feeding and copulations increasing.

With their 8-week-old first clutch chicks still at their heels, the top-ranking pair produced the first egg of a second clutch on October 5, 1963, followed 40 hours later by a second egg.

The other two pairs continued to copulate and sit on their empty nests, but again no eggs were laid. Since one of these males and both the females had been in captivity only since the beginning of the year, I presume that nervousness played some role in their apparently barren condition, as the yard is the scene of almost constant human activity.

On October 29, 1963, 25 days after the onset of second incubation in the successful pair, the first-laid egg showed cracks in its shell pattern. Tragically, however, the gullery was the scene of a great disturbance that night; the eggs were severely chilled, and the pair seemed fearful of any further sustained incubation.

When the eggs were confirmed as being dead, a newly-hatched Silver Gull chick was coincidentally obtained and placed in the now empty nest, which the pair were visiting. It was immediately covered by the female and was fed regularly for two days. However, on the night of the second day it left the nest and became lost, subsequently dying. The adult female continued to bring food to the again empty nest for three days before finally deserting the area. The male reverted to feeding the two first clutch chicks, now quite independent, but always trying for a handout.

By mid-November 1963 all the pairs showed a dulling of the coloured parts, and all reproductive activity gradually ceased. They formed a loose aggregation with the flock, though still in pairs.

No breeding activity occurred in summer. However, in February 1964 the first flush of the coloured parts became obvious again, and to date (April 14, 1964), five pairs are forming, the old pairs having returned to their territories with some rearrangements.

DISCUSSION

That birds in captivity are double-brooded at once raises the possibility that herein may lie the basis of the double-nesting phenomenon which characterises Silver Gull populations in Western Australia. That gulls breed twice a year on islands in the South-West was first clearly demonstrated by V. N. Serventy and S. R. White (1943) who showed that at the Safety Bay islands there was a peak of eggs in May and another in September, with a low level of breeding between. The situation as it exists elsewhere in Western Australia was documented by D. L. Serventy (1952) and reviewed by Serventy and Whittell (1962).

At first sight my data from the captive birds (as pointed out to me by Dr. N. P. Ashmole, with whom I was in correspondence on

the subject) suggest a situation differing from that in the wild birds. The interval of egg-laying in my captive gulls was only 82 days, or barely three months, as compared with an average interval of about four months in the Safety Bay populations. However, King (1913) found with his Port Lincoln birds that the interval between the laying of the clutches was 120 days or about 4 months, which is the same period as found for the birds at Safety Bay. The interval in my birds may have been shortened by the conditions in my aviary, or, perhaps it may indicate the existence of a natural variation.

It would appear, therefore, that the double-nesting on Western Australian islands is due not to there being two separate breeding groups within the local populations but to double-brooding. Whether or not the same individuals were involved in the two breeding seasons in the same year has been a matter of speculation among local ornithologists for some time. Field work to test out the theory is to be undertaken and the captive colony will be maintained.

However, the problem is still bristling with difficulties. Serventy (1952) reported that Silver Gull colonies over an extensive portion of the Western Australian coast had a double-nesting season and that in northern Australia only the earlier, autumn nesting prevailed, whilst in eastern and south-eastern Australia only spring nesting occurred. If double-broodedness is the basis of the situation one would have to assume that potentiality to such has survived only in the Western Australian populations and that due to differing environmental pressures, earlier breeding alone is retained in the northern birds and late breeding in south-eastern and eastern birds.

To add to the complexity of the breeding pattern of the Silver Gull mention may be made of the extraordinary switchover of nesting season by a group of these gulls at a zoo in the U.S.A. (Davis, 1945). After they were received, in 1922, at the National Zoological Park in Washington, D.C., these birds nested for two seasons in November (equivalent to the spring in their homeland). They then adapted themselves to nesting in the North American spring, until 1943, when the descendants of the original stock reverted to nesting in November.

Not only Silver Gulls but a variety of other marine species (documented by Serventy, 1952) exhibit this phenomenon of double-nesting in Western Australia. These include the tropical gannets, cormorants, many terns, and even the Pacific Gull, *Larus pacificus*. Are we to assume that in their cases also double-broodedness is the basic cause? That it cannot be so in the Pied Cormorant (*Phalacrocorax varius*) is clearly apparent from the fact that on the Abrolhos Islands all the birds are spring-nesting and only spring-nesting, whereas on the adjoining mainland they nest only in the autumn (Serventy, 1939).

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TWO HITHERTO UNRECORDED SPECIMENS OF THE NOISY SCRUB-BIRD, *ATRICHORNIS CLAMOSUS* (GOULD)

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Major Whittell (1943) in his survey of extant museum specimens of the Noisy Scrub-bird (*Atrichornis clamosus*) came to a total of 18 skins, of which 10 were in Australia, 6 in the United States, and 2 in England. At the time the war prevented enquiries on the continent of Europe.

Though the recent rediscovery of the species has in a fortunate way caused the importance of old museum specimens to decrease, it is nevertheless of interest to place on record that the Rijksmuseum van Natuurlijke Historie possesses two mounted individuals. These birds are not in a very good condition and, like so many specimens in the old collection, are insufficiently labelled. Such data as are available will be presented here.

The specimen shown on the left, though clearly the older one, is in the better condition. It is undated, and there is no indication of its origin. Underneath the sole is written, in a handwriting unknown to me, "George Sound" and "♂"; in a different handwriting the name "*Dasyornis*." Finally, in the handwriting of van Oort (curator, later director of the Leiden Museum from 1904-1933) the correct identification is given: "*Atrichia clamosa* (G.)." On the card shown on the photograph, which has doubtless been copied from the information given on the sole, the words "*Dasyornis* . . . Gould" and "George-Sound" appear in ink; the name *Dasyornis* is crossed out with pencil and below it is written "*Atrichia clamosa*," in what looks like the handwriting of Büttikofer (curator, 1884-1897). Measurements are: wing 74, tail 90, tarsus, 26½, culmen 18½ mm.

The second specimen (right hand figure) bears on its stand only the name "*Atrichia clamosa*" and the words "Frank 1881," which